DOCUMENT RESUME

ED 319 226 EC 231 117

AUTHOR	Campbell, Ian B.
TITLE	Prevention, The Beginning of the Rehabilitation Process: A View from New Zealand. Monograph #46.
INSTITUTION	World Rehabilitation Fund, Inc., New York, NY.
SPONS AGENCY	National Inst. on Disability and Rehabilitation Research (ED/OSERS), Washington, DC.
REPORT NO	ISBN-939986-60-4
PUB DATE	89
NOTE	51p.; A publication of the International Exchange of Experts and Information in Rehabilitation (IEEIR) project. For a related document, see EC 231 115.
AVAILABLE FROM	IEEIR, World Rehabilitation Fund, 400 East 34th St., New York, NY 10016 ($3.00).
PUB TYPE	Books (010) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Accident Prevention; *Accidents; Adults; Athletics; *Disabilities; Environmental Influences; Federal Regulation; Foreign Countries; Home Management; Occupational Safety and Health; Recreational Activities; *Rehabilitation; *Safety; Traffic Accidents; Traffic Safety; Welfare Services
IDENTIFIERS	*New Zealand

ABSTRACT

The monograph argues that prevention should be considered the first step in the rehabilitation process, and examines preventive efforts in the areas of occupational safety, road safety, home safety, and sporting and recreational safety. Following an introductory chapter, other chapters discuss: (1) the close relationship between compensation, rehabilitation, and prevention; (2) aspects of the cost of social welfare and income maintenance; (3) health effects of the environment; (4) the role of change as an accident-promoting factor; (5) measuring the success of preventive strategies; (6) regulation as a preventive strategy; (7) alternatives and supplements to regulation, such as incentives; (8) road blocks to effective preventive measures; and (9) areas where action is needed, especially the home and recreational activities. Examples of problems and programs in New Zealand are used to support the book's proposals. Includes 58 references. (JDD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Diane E. Woods

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED319226

46 PREVENTION, THE BEGINNING OF THE REHABILITATION PROCESS: A VIEW FROM NEW ZEALAND

By Ian B. Campbell

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

EC231117

World Rehabilitation Fund

International Exchange of Information in Rehabilitation

Monograph #46

PREVENTION, THE BEGINNING OF THE REHABILITATION PROCESS: A VIEW FROM NEW ZEALAND

By Ian B. Campbell, Teaching Fellow
Safety and Occupational Health
Massey University, Palmerston North
New Zealand

International Exchange of Experts
and Information in Rehabilitation
World Rehabilitation Fund, Inc.
400 East 34th Street
New York, NY 10016

ISBN #939986-60-4

Copyright © 1989 World Rehabilitation Fund, Inc. Portions of this publication may be reprinted provided permission to do so is obtained in writing from the World Rehabilitation Fund, Inc., 400 East 34th Street, New York, New York 10016.

TABLE OF CONTENTS

Preface 4

Biographical Note 5

Chapter 1
Introduction 7

Chapter 2
Prevention, Rehabilitation
and Compensation: the Vital Trio 11

Chapter 3
Cost Factors 15

Chapter 4
Health Effects of the Environment 19

Chapter 5
Error-provocative Situations 23

Chapter 6
Measuring Performance 25

Chapter 7
The Place of Regulation 27

Chapter 8
Alternatives and Supplements of Regulation 35

Chapter 9
Road Blocks to Effective Preventative Measures 37

Chapter 10
Where Action is Needed 43

Chapter 11
Conclusions 47

Endnotes 49

Other Monographs in the Series 53

PREFACE

It will not take the reader long to understand that the author of this monograph, the 46th entry into the International Exchange of Experts and Information in Rehabilitation monograph series, has put together a very informative document based on considerable research in the field of Accident Prevention and Safety across several nations including New Zealand, Australia, Canada, Great Britain and the United States.

Much territory is covered in this work—"all you ever wanted to know about accident prevention and safety and were afraid to ask". Ian Campbell has not been afraid to ask and to attempt to answer several very vital questions. The primary question implicit in his work is: should not prevention be considered the first step in the rehabilitation process?

Over the years, the International Exchange of Experts and Information in Rehabilitation (IEEIR) monograph series has covered a variety of topics related to disability issues. A list of the monographs in this series currently available appears at the end of this book.

The International Exchange of Experts and Information in Rehabilitation is funded through a grant from the National Institute of Disability Rehabilitation Research and the purpose of the IEEIR is to "import" knowledge from other countries to the U.S. Since 1987, the project has been focusing its efforts and activities, which also includes a fellowship program, on Asia and the Pacific, the Middle East and Africa.

Inquiries and feedback regarding the project are invited.

Diane E. Woods
Project Director, IEEIR
World Rehabilitation Fund, Inc.
400 East 34th Street
New York, NY 10016

BIOGRAPHICAL NOTE

For twenty-two years, Ian Campbell was the Chief Executive Officer of the Workers' Compensation Board of New Zealand. Then, from 1973 to 1981 he served as the Safety Director for the Accident Compensation Commission. Currently, he holds the post of teaching fellow in Safety and Occupational Health at Massey University in Palmerston North, New Zealand.

Mr. Campbell has traveled widely in Europe, Canada, Australia and the U.S. and has spent a life-time familiarizing himself with the Workers' Compensation systems and Safety and Health regulations in many countries, and has participated in and contributed to numerous national and international conferences.

CHAPTER 1
INTRODUCTION

That the growth of rehabilitation assistance in its many and varied forms has been considerable in recent years, cannot be denied. Even in the poorest nations one can find occasional evidence of this, albeit, mostly as the result of assistance from one of the more affluent nations. But the question still remains; how much is being done to curb the need for rehabilitation in the first place? In a similar vein compensation provisions, whether from some form of social welfare or other schemes such as Workers' Compensation, have also become more comprehensive and generous. So much so that in some quarters the total cost of these schemes is now being called into question. In New Zealand recently, there have been calls for cutbacks in the wide ranging Accident Compensation scheme, as well as changes in the method of funding. However despite widespread public debate on the cost factor, there has been almost no mention of the need to reduce the real source of that cost; the high accident rate. Similarly the need for more effective and more extensive rehabilitation has also gained little attention. Why is this? Is it because it is easier to call for a reduction in benefits rather than to implement practical measures to improve matters?

At the same time, there has been growing concern at the escalating cost of social welfare generally. From this has developed a view that, as a community, we can no longer afford to give our citizens in need, the support that, in more recent years, they have become accustomed to. These issues have also become clouded by a growing concern that many of those seeking support are not genuinely deserving of that help. There is also a common belief that many are the authors of their own misfortune or in other ways not entitled to the community's assistance, at least on the present scale. No one would deny that there is not a small percentage in each sector receiving some form of income support who are undeserving of that assistance. However, there is a grave danger that any controls instituted to curb such problems will also affect those in real need. In all this debate, should not the question be posed—is enough being done to prevent many of these problems arising in the first place? To this, of course, it is also logical to ask whether, when prevention has failed, is enough being done to ameliorate the problem apart from the provision of funds in one form or another?

What then of the total problem? Franklin[1] was probably the first to draw attention to the many similarities between the accident statistics of the United States and New Zealand, the importance of which is evident well

beyond the ambit of pure statistics. Such facts are crucial when considering the relevance of one country's approach with that of another.

Table 1 is taken from that very useful publication from the National Safety Council, *Accident Facts*, giving the figures for 1987 for the United States. Similar figures for New Zealand provided by the Accident Compensation Corporation for the year ending 31 March 1988 are set out in Table 2. Although these figures are not exactly comparable because of differing definitions and methods of collection, nevertheless in both cases the overwhelming preponderance of fatal accidents on the highway is clearly evident, as is the number of fatalities that occur in the home. Thus it highlights that, though New Zealand and the United States may differ in population, size, industry, climate, geography and a host of other aspects, the basic problems are similar. The highway and the home dominate these

TABLE 1
FATALITIES—UNITED STATES

MOTOR VEHICLE		
Public non-work	43,800	
Work	3,900	
Home	200	**47,900**
WORK		
Non-motor vehicle	6,800	
Motor vehicle	3,900	**10,700**
HOME		
Non-motor vehicle	20,300	
Motor vehicle	200	**20,500**
PUBLIC	19,000	19,000

Source: Accident Facts 1987

TABLE 2
FATALITIES—NEW ZEALAND

Year ended 31 March 1988

Road or Street	701
Home	157
Work	97
Sport or Recreation	80
Commercial or Service Location	33
Farm	10
Industrial Place	4
School	1
Not Adequately Described	72

Source: Accident Compensation Corporation

figures, so one could well ask why so much of the preventive effort has been devoted to safety in the workplace.

There has been considerable research into accident causation and the effectiveness of many countermeasures that have been tried over the years. While we have tended to regard occupational safety, road safety, home safety and sporting and recreational safety, as separate entities, most individuals are frequently at risk in more than one of these areas. Why then, is there not more of a common thread running through the preventive efforts in these separate activities? Certainly the need for income support and sometimes rehabilitation is no different for one injured at work, in the home or elsewhere. This point has, seemingly, often been conveniently dismissed. It could be said that, though a great deal of doubt still remains about many aspects, nevertheless it is highly likely that, if all the knowledge we presently have were used, substantial improvements would follow. An essential point to bear in mind is that with the majority of accidents there is seldom a single cause. Most arise from the coincidental occurrence of more than one often quite unrelated event, action or condition.

CHAPTER 2
PREVENTION, REHABILITATION AND COMPENSATION: THE VITAL TRIO

Only in recent years has the close relationship between compensation, rehabilitation and prevention begun to be better appreciated. Recent examples of this are the legislative changes in New South Wales, Victoria, Northern Territory and South Australia following on from the earlier and epoch-making approach in New Zealand: the Accident Compensation Act 1972.

Let's first consider the rationale behind the New Zealand approach. In 1966 the New Zealand Government appointed a Royal Commission to review the then Workers' Compensation legislation particularly in the light of *Convention121* of the International Labour Organisation. At that time Workers' Compensation benefits were not generous, though persons injured as the result of another's negligence could sue at common law for damages. The common law claim of which Ison wrote in *The Forensic Lottery,*[2] became one of the contentious issues. The Commission accepted the argument that the common law approach had many unsatisfactory and capricious features pointing out that:

> "[r]eprehensible conduct can be followed by feather blows while a moment's inadvertence could call down the heavens."[3]

Furthermore a person's need for income maintenance and rehabilitation arises not out of the circumstances of the injury but from the nature and extent of the injury itself. Thus it was recommended that the common law approach should be abandoned because:

> "[d]isparities arise from all the risks of the adversary system—from difficulties of proof, the ability of advocates, the reactions of juries, and unquestionably mere chance itself."[4]

To overcome the considerable opposition that could be expected from the trade unions, lawyers and other special interests to any removal of the well-entrenched common law remedy, the Commission recognized that there must be a substantial compensatory provision. Accordingly it advocated a universal accident compensation scheme providing earnings-related compensation for all accident cases including occupational disease, together with the provision of adequate rehabilitation and more effective prevention. Subsequently this became referred to as the social contract; that is the right to 24-hour earnings-related accident compensation substituting for the loss of the existing common law rights.

Provisions for non-earners included compenstion with respect tp permanent disability, as well as loss of potential earnings, and medical and hospital expenses. Furthermore, the legislation entrusts the administering authority, the Accident Compensation Corporation (formerly Commission) (ACC) with the task of providing the rehabilitation of claimants as well as fostering preventive measures. The levy payable to ACC by both employers and the self-employed covers all employees and the self-employed for accidents both on and off the job. Injuries resulting from motor vehicle accidents are compensated for from levies collected from all owners of motor vehicles while that payable to the non-earners was met from the general taxation.

The recent Australian legislation has not been so bold as that of New Zealand, in that it has not ventured outside the workplace and the highway. Nevertheless, in that country, there has been ample recognition of the need to couple the innovative compensation aspects with equal attention to both rehabilitation and prevention. In Canada the various Workers' Compensation Boards and Commissions have, for many years, also had functions in all three areas, while the prevention activities of Workers' Compensation insurance carriers in the United States has been well recognized with a few having ventured into the rehabilitation field providing their own facilities. In general, however, the three functions have generally been regarded as independent tasks with each standing alone and with compensation taking the major role. Even in New Zealand where the Accident Compensation Act 1972 set into motion a totally new system with one overall administering authority—ACC—compensation and the cost thereof, became the dominant issue. The immediacy of the demand for compensation created its supremacy, no doubt.

In New Zealand, concern with the growing cost of Accident Compensation caused Government to request the Law Commission to carry out a review of its structure and operations. After referring to the important statutory role of ACC in prevention and rehabilitation, the Law Commission commented:

> "[u]nfortunately, what seemed to it to be the more tangible and pressing issues concerning compensation have tended to submerge these priorities."[3]

The Law Commission, however, recognized the difficulties which can arise from a division of responsibility between government departments and other authorities, then stated:

> "Independent delivery of services to promote safety on the roads or in factories or at sea or in domestic environments is one matter. Similar considerations apply to both primary health care at the first stage of

rehabilitation and vocational retraining at another. But policy and its coordination must have a much wider perspective and be decided at a different and earlier level."[6]

In both South Australia and West Australia the Workers' Compensation legislation and the relevant administrative authorities include "Rehabilitation" in their title, while in New Zealand, the recent report of the Law Commission includes an outline of a draft Act entitled; "the Safety, Rehabilitation and Compensation Act". In the Australian states mentioned, it is significant that, at the same time that the compensation laws were being substantially amended considerable changes were also being implemented in the occupational health and safety legislation. The universal nature of the problem of cost can be gauged from the following comment of Chelius with respect to the position in the United States:

"...it is noted that from 1950 through 1983 workers' compensation costs as a percentage of payroll almost tripled, with a particularly large increase from 1972 through 1978."[7]

CHAPTER 3
COST FACTORS—THE INFLUENCES FOR CHANGE: IS IT COST vs. HUMANITY?

Despite all the changes and innovations that have been introduced in many countries in the last decade or so, the concern with cost still predominates. Unfortunately the cost of undertaking a particular approach always seems to attract much more attention than the cost of failing to take action. Regrettably in such arguments we are limited in our ability to quantify many of the costs and, even more so, the benefits. Furthermore to a great extent, costs fall on one section of the community; employers and owners of motor vehicles but, in some cases, on the taxpayers. The benefits arising from preventive measures, however, often seem rather tenuous to those providing the funds. Again, in general, the providers of the funds are usually organized, while rarely are claimants organized.

It is not surprising that the community as a whole seems to be increasingly skeptical of the income support measures that they are being asked to fund through taxes, insurance premiums, payroll deductions and in other ways. Furthermore, as we continue to live at a time of growing violence and anti-social behavior, individuals, who seem quite unconcerned with the safety of their own life and limb, as well as that of their fellow citizens, sometimes attract considerable publicity. One New Zealand researcher, Parsons,[8] examined the social characteristics of 1509 serious traffic offenders analyzing their traffic and non-traffic offending behavior over the previous 15 years. The research clearly demonstrated a strong positive relationship between serious traffic offences and conduct of a violent anti-social nature generally.

However, the fact that by far the majority of accident victims may be largely if not wholly innocent of any real blame, goes almost unnoticed. Thus it seems clear that these negative influences should be countered by all means possible. After all the violent offenders mentioned in the above study are, fortunately, only a small segment of our society even if their activity attracts a large amount of media attention.

Aspects of the Cost of Social Welfare and Income Maintenance

In many jurisdictions the better treatment accorded to the traumatically injured as opposed to the sick and chronically ill and the aged is largely historical. Towards the end of the 19th and early in the 20th century the idea that employers should be responsible for meeting the cost of compensation, medical and hospital expenses for those injured in their employment

became widely accepted. More recently it has also become accepted that the negligent driver of a motor vehicle should also be held accountable for any personal injury caused. However the needs of the individual for compensation and rehabilitation consequent to an illness or a disabling congenital condition and many of the aged, are no different. Yet, in most communities, taxes that would be required to treat such cases in the same way as accident victims cannot be supported. Why is this?

One can only surmise that it has been much easier for governments to pass laws requiring employers and motorists to accept what can be substantial liabilities than it has been for them to increase taxes to provide more generous social welfare benefits. Another factor is that, in many countries, the insurance coverage for work and highway accidents has been provided by a number of individual insurance carriers where the combined total cost of such coverage does not get the same publicity as does the burgeoning social welfare budget. The same applies with schemes like the New Zealand Accident Compensation one where its aggregate cost is highly visible and thus can draw much criticism.

The Need For Better Social Cost-Accounting

While the cost of any preventive strategy may well be identified and quantified, it is the determining of the cost of not doing so, which provides the greatest challenge. In many instances the cost of the preventive strategy lies with one authority while the cost of injury and damage rests elsewhere. For example, the cost of highway improvements such as median barriers, set against the cost of compensation, medical, hospital and rehabilitation expenses for those involved in a head-on collision.

Traffic safety authorities have been involved in a great deal of research into both the cost-benefit and cost-effectiveness of many countermeasures that have been undertaken. Unfortunately the assessing of benefit as against cost is a complex and difficult matter.

Better Data Required

The need is not only for more comprehensive statistics but for other essential information such as a better understanding of such matters as accident causation and behavioral aspects. While a great deal of research has been undertaken in many countries, the overall picture is rather fragmented with many researchers being influenced by the availability of funds and the particular interests of the groups providing those funds.

Everywhere the call is for better accident reporting. Certainly to the extent that persons injured at work will report accidents in order to ensure that they obtain the compensation to which they are entitled, then it is reasonable to assume that, within the limitations of the compensation legislation, statistics based on those reports will be reasonably comprehensive with respect to basic facts. Details of causal factors cannot be expected to be very reliable and much will also depend on the extent and accuracy of the statistician's coding. Even in *Table 2*, 72 fatalities are listed as not adequately described. Another source of accident data are reports made to enforcement agencies but these too, have their obvious problems.

CHAPTER 4
HEALTH EFFECTS OF THE ENVIRONMENT

There is increasing evidence that the impact of the environment particularly that of the workplace, its activities and, sometimes its products, may be much more detrimental to the health of the community, than is presently recognized. In the most advanced industrial nations, there is growing concern about this aspect and nowhere has that concern gained greater attention than with respect to asbestos. There are many substances in use in industry today that are or can be dangerous to health and many more substances are suspected of being harmful. It has been variously estimated that about 2,000 substances are suspected of being carcinogenic. In many cases proof of the causal connection between the work and the illness is either lacking or insufficient, while there are undoubtedly other cases where any possible work connection at present remains completely unrecognized. Apart from the effect of toxic and other harmful substances, there are other problems in the psychosocial and psychosomatic area. The main one is stress. The disposal of hazardous waste is also fraught with difficulty and this may lead to covert or entirely disastrous practices being adopted.

Although the relationship between work and many illnesses has, in some cases, been known for many years, the very slow progress toward adequate Workers' Compensation coverage has been all too evident in almost all jurisdictions. At the same time preventive measures have lagged even more than compensation provisions. This, despite the work of Agricola and Paracelsus back in the 16th century; and 17th century advice to the medical profession of the father of occupational medicine, Ramazzini—ask a sick worker, what is your occupation?[9] Advice that, even today, is still far too often overlooked. Understandably, Weiler stated:

> "Industrial disease bids fair to be the major battleground of the next decade, exposing serious questions about the future viability of Workers' Compensation."[10]

The true extent of the problem in the workplace is unknown. For example, in the United States the annual death rate from occupationally-related illness has been variously estimated from as low as 1,000 to as high as 100,000. The report of a United States task force commented:

> "...no better estimates are available, partly because most occupational disease is not diagnosed or recorded. More research is needed to identify the effects of harmful substances or combinations of substances whose interactions are suspected or unknown."[11]

Barth and Hunt after discussing the 100.000 estimate mentioned above state:

> "It would appear that the NIOSH estimate represents a 'quick and dirty' approach to the matter though the biases are not at all apparent." [12]

But they later comment that despite the doubts raised about the estimate:

> "...it would be inappropriate to dismiss the effort summarily." [13]

From all the evidence available it does seem clear that at the very least the problem is substantial and much greater than is generally recognized.

There can be no doubt that up to the present most emphasis has been placed on safety issues as opposed to health problems. In earlier days, that was almost exclusively the case. It is suggested that this is due in part to the influence of Workers' Compensation, for in most jurisdictions, initially only traumatic injury was covered. In many cases, when it was eventually decided to provide compensation for "industrial disease," it was thought that the situation could be met by prescribing a modest number of diseases together with the corresponding industries or occupations in which the disease was considered to have been contracted; thus establishing a presumption that the disease was work-related. That meant unless t[illegible] some general provision, leaving open the possibility of actually p[illegible]ng th[illegible] work-connection, some claimants would miss out until the authorities recognized the justification for adding another disease to the list.

The standard of proof required before a particular condition could [illegible] proved to be "due to the nature of any employment" presents many difficulties. This reflects an intention to ensure that liability to pay compensation only related to the offending exposure with the responsible employer. Roblee points out that the failure of so many workers to meet their legal burden of proof is a medical matter rather than a legal one. It is a consequence of the shortcomings of medical knowledge.

> "Responsibility for the initial research and surveillance necessary to identify hazards and for reduction of contaminant levels should rest with industry." [14]

While these problems may result in the person concerned being unable successfully to claim compensation, it is highly unlikely that, in such circumstances, preventive measures will be put into effect. Then there are many conditions, which can be related to a work situation which may also be caused by conditions other than those experienced at work. In addition there are some illnesses which may only develop over a long period of time, even many years after the original exposure responsible, and without, in

the meantime, demonstrating any obvious or recognizable symptoms that suggest a connection with that long past exposure. In other cases it may not even occur to the patient that the illness may be due to that past exposure and the doctor may not ask questions that elicit that information.

Toxic Substances

Varying estimates have been made of the numbers of potentially hazardous chemicals being used in industry today. To quote Barth and Hunt again:

> "Different estimates exist of the number of new chemicals developed and used in industry each year. Peters, for example, asserts that U.S. industry has about 5,000 chemical substances in common use and 500 new ones are added annually. The New York Times cites an EPA estimate of 1,000 new chemicals being introduced, commercially, each year...in 1973 NIOSH listed over 25,000 entries, involving 11,000 different substances...A subset of these identified by NIOSH as 'suspected carcinogens' numbers 2,415. The enormity of this ever-growing list of chemicals alone suggests an increasing source of occupational disease. Many of the items listed were not known or did not exist only a few years ago...there is also a possibility that the list could be expanded by recognizing that even certain 'safe' chemicals may become toxic under appropriate conditions." [15]

In a Working Paper on workplace pollution prepared by the Law Reform Commission of Canada the following recommendation appears:

> "Legislation or regulations applicable to workplace pollution should:
> (a) specifically indicate that employers must inform employees about the identity and potential hazards of all substances or physical agents present in the workplace which might be dangerous to safety and health;
> (b) require employers to compile and update inventories of such substances and physical agents, and of all information in their possession with respect to their potential hazards, on a periodic basis, and make these inventories available to the regulatory agency and to employees or their representatives;
> (c) specifically indicate that employees are entitled to all information from tests of workplace conditions, or reports on those conditions, whether prepared or conducted by officials of the responsible government agency or by representatives of the employer." [16]

It is suggested that these represent no more than reasonable and necessary requirements.

Ergonomics

Ergonomics has been described as a combination of psychology and engineering with a good measure of common sense thrown in. It deals with the relationship between the individual and the working environment and

its principles are continuing to gain much wider acceptance. Many accidents occur and health conditions arise because of a mismatch between a person and his or her environment. The range of such factors is great and can vary from a confusing array of dials or controls of highly sophisticated machinery to office seating and the arrangement of work stations generally. The advent of computers and VDU's alone, has given rise to a recognition of the need for much more attention to the design of the office layout. It has application in every home as well. Here the barrier free environment as advocated by Wrightson and Pope is also very relevant (see WRF Monograph #44). More attention being given to ergonomic principles could bring about substantial reductions in both injuries and work-related illnesses.

CHAPTER 5
ERROR-PROVOCATIVE SITUATIONS
THE EFFECT OF CHANGE

In recent years the role of change has become better appreciated as an accident-promoting factor. The devastating explosion at Flixborough, England, with the loss of many lives and vast property damage is frequently cited as a graphic example of a failure to appreciate the effect of change. This occurred when there was a temporary replacement for a damaged vessel. As Johnson puts it:

> "Change is the mother of twins: progress and trouble. The role of change in accidents and the significance and usefulness of change-based preventive and analytic methods have emerged in the past 15 years as critical management and safety skills." [17]

This is applicable to the total accident scene with the home being equally as involved as the highway and the workplace. Apart from the problem with temporary replacements as at Flixborough, many changes in industry involve more powerful and very sophisticated equipment or systems which place much greater demands on the workforce. Then there have been numerous instances of highway improvements leading to higher speeds, a higher accident toll and a subsequent demand for more effective median barriers or other additional improvements. Today we not only face considerable changes in every type of activity but the rate of change is itself increasing at an exponential rate as Alvin Toffler so dramatically reminded us in *Future Shock*.[18]

Human Error—An Accident Cause?

Johnson defines error as: "...any significant deviation from a previously established or expected standard of human performance that results in unwanted delay, difficulty, problem, trouble, incident, accident, malfunction or failure." [19]

The key to success in preventive measures is to recognize that it is the system that has failed rather than the individual. As Kletz said:

> "Well-trained, well-motivated men, physically and mentally suited to the job they are doing, and properly trained, make occasional mistakes whilst carrying out jobs that they have often done before. We should either accept an occasional mistake...or change the work situation. Telling people to be more careful or punishing them will not prevent mistakes ..." [20]

What has often been insufficiently recognized has been the part played by management errors. A graphic example is to be found in the report of the

Royal Commission which investigated the DC 10 crash on Mount Erebus, Antarctica. Para. 393 of that report reads:

> "In my opinion therefore, the single dominant and effective cause of the disaster was the mistake made by those airline officials who programmed the aircraft to fly directly at Mt. Erebus and omitted to tell the air crew. The mistake is directly attributable, not so much to the persons who made it, but to the incompetent administrative airline procedures which made the mistake possible." [21]

Unfortunately all too often in the past, when such incidents have been investigated, the upshot has been to blame the individual rather than the system, even to admonishing the person seemingly in error to be more careful. This very common response to an accident must be avoided at all costs and this must be clearly laid down in the system adopted.

CHAPTER 6
MEASURING PERFORMANCE
HOW SUCCESSFUL HAVE WE BEEN?

The measures that can be used to judge the success of any preventive strategy are many and varied but all have some limitation and, at times, have been subject to considerable criticism, e.g.the commonly used frequency and severity rates. With some preventive strategies there has been a great deal of success, one has only to think of the vast changes that have been made with respect to the guarding of moving machinery. In other areas preventive measures have been adopted very slowly and after many deaths have occurred. Though the hazards of asbestos have been known for many years, excessive exposure in mines, manufacturing and of the end-users of this substance has continued until relatively recently, resulting in many deaths and serious illnesses. Again it must be recognized that some situations are easier to right than others. Sometimes a single action is all that is required, but in other circumstances continual attention is needed.

With each improvement, the task of dealing with any residual problems can become not only more difficult but often more costly. Then, too, attempts to assess the success of a particular measure, have also to bear in mind that other influences may be operating at the same time. New regulatory requirements may coincide with a substantial upsurge in new procedures being adopted voluntarily or there may be other factors quite unrelated to safety measures such as changes in technology or the process itself. The containerization of sea freight has revolutionized work on the world's waterfronts, substantially reducing the amount of manual handling. Ellis in his review of safety research was puzzled. Although there had been a steady improvement in the overall accident rate during the past 50 years he noted that there were also many negative conclusions from research studies with respect to the effectiveness of many of the preventive strategies be implemented. He commented:

> "Despite the obviously inadequate level of understanding of the causes of work accidents, it is important to note that the rates of serious work injuries have dropped significantly since reliable data first became available in the 1920's. The reason for the decline is still unknown; but the observation that similar reductions have occurred for home and public (non-motor vehicle) accident rates over the same period suggests that the predominant etiological factors may not have involved safety innovations of any type. Rather, historical reductions in serious accidental injuries could be due to such things as substantial improvements in general health and perceptual-motor coordination among the American populace." [33]

It would be tragic, however, were we to be deterred in our preventive and ameliorative efforts by such disappointing conclusions that are to be found in many research papers. In safety, as elsewhere, statistics are open to differing interpretations by individual users and the same basic data may be used in varying ways. The concern with the increasing toll of deaths on the highway can be tempered when those figures are compared with fuel consumption or vehicle-miles travelled or when related to the total population. In the United States, for example, in the decade 1970-80 the total number of motor vehicle deaths dropped 4%. When measured against the national population the reduction was 13%, against the number of motor vehicles it was 35% and on the basis of vehicle-miles, 29%.

Not surprisingly the need for some other measure of safety performance has been recognized. At the same time it must also be recognized that it is very difficult to measure health performance because of the many difficulties in arriving at the true incidence of work-related illnesses or any other measure of the success in the controlling of the work environment. A publication of the British Health and Safety Executive after referring to the shortcomings of the conventional measures suggests that:

> "...more meaningful information would be obtained from systematic inspection and auditing of physical safeguards, systems of work, rules and procedures and training methods, than on data about accident experience alone." [23]

It is not surprising, therefore, that well structured safety audits are gaining a large following in industry. Furthermore, it is claimed, with some justification that such approaches often have spin-offs in the way of improved productivity, industrial relations and general efficiency. After all, it is often the same apathy toward sound work practices that can cause accidents as well as other unwanted outcomes such as spoilage.

CHAPTER 7
THE PLACE OF REGULATION

For many years regulation in its many forms has been the most visible preventive strategy both in the workplace and on the highway and in earlier years it was almost the sole influence for safety. Even today many still believe that the solution to the accident problem lies in more regulation and stricter enforcement. Though regulation has its role to play, its limitations need to be better appreciated. There have been many studies examining the effectiveness of regulation which have come to some quite dismal conclusions. At the same time, it is not difficult to accept that without some measure of regulation there could be chaos. In some situations regulation would be almost, if not entirely, inappropriate, i.e. in the home front and in sporting and recreational activity. Even in the workplace there are limitations to the opportunities for regulation, thus leading to a call for more self-regulation.

In recent years one of the most compelling influences for the implementation of a greater degree of self-regulation in the workplace has been the Robens Report published in Great Britain in 1972. In view of the wide interest that this report aroused together with the subsequent legislation, it is of more than passing interest to examine the committee's recommendations which were summarized as follows:

- We need a more self-regulating system of provision for safety and health at work. The traditional approach based on ever-increasing, detailed statutory regulation is outdated, over-complex and inadequate. Reform should be aimed at creating the conditions for more efficient self-regulation by employers and workpeople jointly.
- The efforts of industry and commerce to tackle their own safety and health problems should be encouraged, supported and supplemented by up to date provisions unified within a single, comprehensive framework of legislation. Much greater use should be made of agreed voluntary standards and codes of practice to promote progressively better conditions.
- This broader and more flexible framework would enable the statutory inspection service to be used more constructively in advising and assisting employers and workpeople. At the same time it would enable them to be concentrated more effectively on serious problems where tighter monitoring and control might be needed.
- A single centre of initiative is needed to replace the present heavily fragmented administrative arrangements. A national Authority for Safety and Health at Work should be established.[27]

The call for more self-regulation gave rise to considerable doubts with many questioning the practicability of the suggested approach, given the extent of the prevailing "apathy". However the Committee was not simply

27

envisaging the replacement of enforcement by an external agency, with employer-applied internal self-regulation, but rather that these two approaches should be complementary. Furthermore, the recommendation was that the workforce should also be fully involved. Thus factors beyond the scope of regulation could be better covered.

Origins of Legislation

While some legislation has stemmed from a specific report, as with the British Health and Safety at Work Etc. Act 1974, other legislation has arisen out of public concern following a disaster. Legislative changes have also had their origin in party political policy, often in the wake of an election followed by a change in government. In general however, occupational health and safety have not stood very high in the list of priorities of many governments, though more recently, in some countries, such as Britain, Canada and Australia, this has been changing. On the other hand, lately there has grown up in a number of countries, a call for less regulation, even deregulation, and for the benefits of any proposed course of action to be carefully weighed against the costs; not an easy exercise.

It is very questionable whether legislation passed in response to a public demand will necessarily result in the most needed or most effective law. The difficulty facing the U.S. legislators was succinctly put by Calabresi and Bobbitt when they wrote:

> "Consider the different attitude we all share toward the failure of Congress to pass truly effective safety legislation, as against the attitude we would have were it unwilling to appropriate funds for the rescue of a trapped hostage. Lives may be discarded in both examples, but the choice is less exposed in the first case and therefore less destructive of some of the basic values involved."[25]

Effectiveness of Regulation

In a paper presented to an international conference at Adelaide, Australia in 1986, Wigglesworth pertinently asks the question: How effective is modern safety legislation? After referring to the fact that we really do not know how many have escaped injury by reason of the legislation, he then commented:

> "How ethical is it to promote a strategy when the effectiveness is not known? To take a parallel instance, how ethical would we deem the behavior of a physician who prescribed a course of drug therapy without knowledge of the expected outcome? We would of course deem such behavior unethical."[26]

Few would question the need for standards relating to health and safety

in the workplace, on the highway or elsewhere but there could be considerable debate on the need for and the extent of particular standards and the means by which those standards may be enforced. To make the necessary judgements any legislator or enforcement agency needs adequate and reliable data, as well as, generally, in-depth research; elements which, regrettably are so frequently not available to them. Consequently they are forced to fall back on hunches, intuitive thinking or political expediency upon which Arbous pertinently comments:

> "Some of these are sound and well substantiated by research findings. Others are rather shaky and arise out of investigations of doubtful and inconclusive nature; and still others are merely the result of armchair speculations which at times reveal great perspicacity of thought but more often reflect the personal prejudice of the thinker."[7]

While there are those who would spare no effort to ensure that the community is free from the threat of injury, there are also those who see safety legislation as threat to their economic survival or at least an affront to their freedom of action. The often voiced comment—that even if it saves one life, it will have been well worthwhile—completely overlooks the possibility that another line of action, no more costly, may save more than one life.

What is less well understood is that even if, in any one enterprise, there was perfect compliance with all of a comprehensive range of regulations, there could still be injuries and work-related illnesses. Simply put, many accidents arise out of circumstances which are not subject to regulation and, in many cases, for which the framing of a regulation would be very difficult if not impossible. An example of a successful regulation frequently cited as such is the British Power Presses Regulations of 1965.[8] That these regulations resulted in a substantial drop in power press accidents, could well be due to the fact that not only were they highly specific but they were also accompanied by thorough training of operators and tool setters. Furthermore their implementation was preceded by detailed studies and the regulations thus seem to be in accord with four principles suggested by Wigglesworth:

> "There must be knowledge of the legislative requirements, which must be easy of comprehension; they should be technically practicable; there should be adequate motivation towards compliance; and they should permit ready detection of non-compliance."[9]

Thus there seems to emerge the conclusion that the effectiveness of any regulatory measure is firstly dependent on its own structure apart from any question of the commitment to its actual enforcement. Apart from the many unsafe situations and acts that do not lend themselves to regulation

because of their very nature, frequently breaches of regulations may be of a momentary nature and thus are not easily detectable or remedied other than by alert and competent management.

Wigglesworth in the paper previously referred to after citing studies that had been made into the effectiveness of legislation in the United States, Canada, Britain, Australia and Holland concluded:

> "...the evidence presented here suggests that there are now serious limitations to the effectiveness of safety legislation in today's complex societies."[30]

After referring to research that emphasized the value of passive preventive measures, those that were independent of human behavior, he then advocated the need "to ensure—if need be by legislation—that adequate expertise is at all times available to the organization concerned." He then went on to stress the need for "the identification and acceptance of a specialist body of knowledge on occupational safety and health and...that of accreditation."

Regulations may require an individual, often the person most at risk, to undertake certain precautionary measures or to refrain from some action or behavior. Success of such requirements is entirely dependent on the cooperation of that person at all times. Recognizing that even the most capable and conscientious person will make the occasional error, many advocate passive measures which do not rely on the active participation of the individual. A much publicized example would be the preference for the passive air bags in motor vehicles as opposed to seat belts which require an individual to buckle up.

In 1973 a National Commission on State Workers' Compensation Laws reported to the President and Congress of the United States. Subsequently three volumes of supplemental studies were issued. In one such study Chelius concluded: "...there is little evidence that these regulatory attributes have had a beneficial impact on the injury rates."[31]

Sanctions

There are widely varying views on the need for, the appropriateness and the effectiveness of sanctions. In a novel approach Ison contrasts the position of two employers (A and B) both of whom set out to dig a 3m deep trench in sandy country. Though each trench has vertical sides, no shoring is provided and in each case there is an earth fall. In A's case a worker is killed leaving a wife and three children but with B, there is no injury. A is

the subject of considerable condemnation and is prosecuted. In B's case no action follows. In contrasting that position with the need for sanctions Ison comments:

> "Which of those two employers is more likely to repeat behavior of that kind? If A has any humanity in him at all, it is surely least likely to be A... But unless sanctions are invoked, nothing has happened to change the behavior patterns of B. Of these two employers, it is surely B who is most likely to see no harm in what he has done, and surely B who is more likely to continue the same course of hazardous behavior in the future if no action is taken. If sanctions are to be used effectively for preventive purposes, there is surely a greater need that they be applied to B than to A. In other words, the success of any enforcement program will depend largely on the extent to which it can invoke sanctions for preventive purposes rather than having them used only as a act of retribution after the event."[32]

As would be expected the Robens Report devoted considerable discussion to this topic and questions the appropriateness of the criminal law to deal with infringements. After referring to the irrelevance of criminal proceedings in most such cases the report went on:

> "We recommend that criminal proceedings should, as a matter of policy, be instituted only for infringements of a type where the imposition of exemplary punishment would be generally expected and supported by the public. We mean by this, offenses of a flagrant, wilful or reckless nature which either have or could have resulted in serious injury."[33]

Administrative sanctions such as improvement or prohibition notices were recommended for the run-of-the-mill offenses where "advice and persuasion fails or pressure is necessary."

We are thus still left with a variety of views. In so far as prosecutions are concerned, it is clear that the rather onerous procedure involved is a considerable detraction but when such measures as improvement and prohibition notices fail then clearly some other remedy is needed. The answer may well lie in the adoption of a less onerous procedure such as the instant fines imposed for some traffic offenses. Ison's point of view also has to be considered: should penalties be determined by the nature of the offense rather than the usual policy of varying them in accordance with the seriousness of the injury incurred?

Others put forward the idea of a more drastic approach, that of treating, in appropriate circumstances, the injuring and killing at work as crimes and thus leaving the way open for offending owners and managers of undertakings to receive prison sentences. In this, some draw the parallel between the criminally irresponsible act in a workplace and that on the highway and question the contemporary attitude of society which often

has a different view towards the so-called "white-collar crime". Glasbeek and Rowland provide a very detailed examination of the principles involved and they conclude:

> "We believe that to perceive health and safety at work from the worker's perspective, a belief which may gain adherents by the use of the criminal process, could lead to better enforcement of existing conditions and to the promulgation of more exacting ones."[34]

A considerable stir was caused in the United States when corporate officers were charged with murder and other offenses and convicted following the death of an employee in a silver recovery plant.[35]

The important issue raised in that case was, that until very recently, corporate officers had never been held to be individually liable. This was the first time that such have been convicted of murder for for a failure in their duty to provide workers with a safe place of work.

Many issues are involved. For example, the position of subordinate managers who may have to differentiate between their duty to the company and its shareholders and their duty to safeguard the workers. This could be a cause of considerable personal conflict. In many cases it could be a question of who to prosecute. One may well ask what would be the position of a subordinate manager who may have cut corners in a way which could be considered criminally negligent but, which he could justifiably claim, was in response to a directive to reduce costs and which emanated from the board of the company far distant from the actual workplace.

In most instances where more drastic measures have followed a disaster about which there has been a public outcry, the traditional response is more in the nature of a call for retribution than to establish a deterrent and deterrence is surely the objective of occupational health and safety legislation rather than retribution. Nevertheless it is difficult to reconcile, the seemingly different public perception between death and injury on the highway and death and injury in the workplace. Such a view is reflected in a recommendation in the working paper of the Law Reform Commission of Canada on workplace pollution already referred to:

> "As a general principle, legislation should not be structured in a way which might result in treating the infliction of harm or the creation of an increased risk of harm in the workplace as in any way less culpable, or less deserving of criminal sanctions, than analogous inflictions of harm or creations of an increased risk of harm in other contexts."[36]

Perhaps the only conclusion one can be certain about is that govern-

ment's task to determine the shape of any legislation and the extent of its enforcement is not an easy one. Nevertheless, there are many useful and authoritative guidelines to be found in the many research studies that have been made.

CHAPTER 8
ALTERNATIVES AND SUPPLEMENTS TO REGULATION

Incentives

In the workplace incentives, in varying forms, have been in place for many years but most of the research that has been undertaken has found little evidence of the effectiveness of that approach. Many of the earlier writers on workplace safety have emphasized the part played by Workers' Compensation in imposing the cost of accidents upon the employer thus creating a considerable incentive to make the operation safer. Coupled with this view has been the growth of experience or merit rating, that is, varying the individual insurance premiums in accordance with the claims experience or the accident rate of the individual employer. Despite the popularly held view, especially in North America, that such schemes are very effective, there is almost no evidence to give general support to that view from the various empirical studies that have been undertaken. Such schemes are limited in their application to the larger employers and in the United States the activities of about 80% of employers are too small to be experience-rated and many medium-sized operations are only partially experience-rated. It is interesting to speculate as to why experience-rating is seemingly supported almost without question in the United States despite the discouraging evidence from most empirical research studies.

In some of the individual states, until the passing of the Occupational Safety and Health Act in 1970, the enforcement of legislation as we have come to know it in the British tradition was far from being a feature of the scene. Sands,[37] P.E. How Effective is Safety Legislation? Sands, outlines the meager enforcement that then existed in Michigan. To a considerable extent the greatest influence for safety was the accident prevention advice and service that Workers' Compensation insurance carriers provided for their clients. No doubt this close tie was not without its considerable influence with respect to experience-rating.

Apart from the question of the justification for experience-rating, whether on the grounds of prevention or equity, it is no light task to develop a suitable formula that is easily understood and stands a possibility of producing results. With all the difficulties in developing an appropriate scheme and the shortcomings of many such schemes, it is surprising that they still seem to attract unquestioning acceptance. This may be due to the fact that more benefit through receiving rebates than have penalties imposed. In New Zealand ACC did award rebates for a period but abandoned the practice on the grounds that it was ineffective. Unlike the former

Workers' Compensation Board it did not impose penalties for poor accident experience though empowered to do so. Despite the doubts raised by most of the empirical studies there is some validity in the view that strong penalties do bring results. Penalties based on accident experience can be imposed even though the enforcement agency may have no grounds for applying its sanctions. Regrettably, however, experience-rating is still an after-the-event approach.

So much for the workplace. What of incentives for drivers of motor vehicles or for the populace when in their own homes, as well as activity in the sporting and recreational area. In discussing the so-called deterrent effect of the common law action the Woodhouse Royal Commission stated:

> "On the highway, for example, motorists who are not deterred from dangerous driving by the instinct for self-preservation or the chance of a cancelled driving license will not be greatly moved by the passing thought that damages might have to be paid, not by themselves, but by their insurers. If conscience, safety education, enforcement by inspection, and self-interest all fail, then the sanctions of the criminal law still remain, and in our view, at this point should be applied. Employers and motorists cannot insure against fines, cancelled driving licenses, or in the final resort, imprisonment."[8]

With respect to the home, and the sporting and recreational arena, probably the only deterrent must surely be the instinct for self-preservation, but that has its limitations as pointed out above. An examination of the statistics of fatalities in the home, whether in New Zealand, the United States or elsewhere will reveal a predominance of two age groups; the very young and the aged. The inexperience and natural curiosity of very young children and the frailty of the aged present major considerations vis-a-vis prevention of accidents.

In both sport and recreation we have the desire for adventure and the testing of one's self to the limit, not to mention the enthusiasm of many for bodily contact sports. There is little externally imposed enforcement but most of the bodies responsible for administering various sports and recreational activities play a very useful role in controlling their activities and keeping reckless acts to an absolute minimum. Indeed many would claim that self-regulation by those bodies and their membership individually, is by far the most effective measure that could be adopted.

CHAPTER 9
ROAD BLOCKS TO EFFECTIVE PREVENTIVE MEASURES

Causation

Many see the understanding of causation as the key to arriving at successful countermeasures. Unfortunately in this lie many potential pitfalls, for without in-depth study of all the circumstances leading to accidental injury, quite misleading conclusions can evolve. The findings of a comprehensive report prepared by Arthur D. Little Inc. for the Automobile Manufacturers Association Inc. on traffic safety are of more than passing interest. The report that highway safety is a systems problem calling: "for an understanding of a wide variety of social, economic, political, psychological, legal and physiological as well as engineering factors related to the highway, the vehicle and the driver."[39]

It then goes on to stress that the concept of cause has little operational significance in the study of accidents stating that:

> "Traffic accidents are most meaningfully viewed as failures of the system rather than as failures of any single component. To a larger extent than usually appreciated, several factors simultaneously contribute to most accidents; changes made in any of these could have prevented the accident or at least moderated it. Statements of the form that '80 percent of accidents are caused by the driver' represent a simplistic view of the situation and are not supported by the technical literature that we have reviewed."[40]

Despite the fact that the Arthur Little Report is aimed at the traffic accident situation its conclusions are very relevant to other aspects of the accident scene, especially the workplace where there has developed an increasing recognition that attention should be directed to the system rather than to the individual.

Being aware of what are, at times, contradictory indications from research it is important not to fall into another possible trap: that of yielding to the popular clamor for action that may be highly visible, yet can be very costly and of questionable effectiveness. As Haddon et al. point out when commenting on legislation passed in response to a popular demand:

> "...the history of safety legislation also demonstrates that really costly safety devices or regulations can be most swiftly and effectively forced upon a specific industry...by a public that has been outraged by a specific disaster or by a widely publicized death toll...In the absence of such disaster, the public as a whole appears to have been largely unwilling to assume the cost of countermeasures when lives to be saved or lost are the cumulative result of many accidents widely distributed in time and location."[41]

And in another vein after pointing out the tremendous effort that went into developing the Salk vaccine and proving its cost efficacy and relative safety:

> "One can, of course argue that the introduction of essentially unevaluated prevention measures "can't do any harm," but two potential dangers in this approach need to be noted. First, the introduction and enforcement of insufficiently evaluated measures may lead to an inappropriate choice of emphasis and may, as a result, dissipate funds, time and public concern that might be applied to more effective measures. Secondly, the public and its government may conclude that everything that can be done is being done."[3]

There still remains a great deal of folklore surrounding "accident causation" and the reason is not difficult to establish, for in the absence of a real understanding of the problem on the part of the general public, pet theories, and, consequently solutions of doubtful value abound.

> "But an adequate accident-research program, like broad research programs in areas of more traditional medical concern, may require, depending on its focus, professionals trained in many disciplines, not merely in safety engineering and "safety education" but also in anthropology, psychology, sociology, mathematics, medicine, anatomy, physiology, psychiatry, chemistry, information theory, architecture, city planning, and others."[3]

The authors, Haddon, et al, then went on to emphasize the shortage of these skills being applied in accident research and that as a consequence of inadequate professionalism, countermeasures were frequently adopted "...without adequate evidence of their effectiveness or provision for their continued evaluation after adoption."[4] Many problems stem not only from a public misconception often based on an emotional reaction to an event or to an unjustified assessment of facts presented in the media. As Haight comments:

> "...we began to realize, perhaps less than 30 years ago, road trauma was not a problem to be solved. This was a hard pill for politicians to swallow in the 1960s, when everything from cancer cures to moon travel was considered just a question of appropriate budgeting. Viet Nam, that ultimate failure of budgeting, brought politicians down at last, and it seems that they are now willing to accept that traffic accidents are not necessarily amenable to well intentioned programs. Unfortunately, the public is still not convinced."[3]

And then:

> "The second important change in our thinking occurred when the idea of simple 'causes' of accidents was erased from our professional vocabulary, and with it the concept of 'blame' assigned to any one component of the system. According to the 1966 Arthur D. Little report, 'The concept of

cause has little operational significance,' and most informed people now agree. This too is a hard idea to explain to politicians or to the public."[38]

The Arthur D. Little study abandoned the word "cause" and the use of the phrase "contributing factor" throughout our report.[39] In a report to the New Zealand Medical Research Council Langley and McLoughlin[40] give cogent reasons for using "unintentional injury" in preference to the more usual "accident".

Victim Blaming and Accident Proneness

One of the greatest difficulties facing those advocating increased and more effective preventive measures is that of "victim blaming", a belief that a great many of the accidentally injured are the authors of their own misfortunes. In many cases a superficial examination of the circumstances surrounding an accident will suggest that to be the case, but one needs to look deeper. There is a world of difference between a motorist who is injured as a consequence of a reckless overtaking maneuver on a narrow, winding road and a factory worker injured while using a machine with a safety device deliberately put out of action to speed production or make the job easier. In the factory, it is the responsibility of management to set up and supervise a system which will ensure that such events are kept to an absolute minimum if not completely eliminated and providing competent middle management and supervisors.

The accident proneness theory, which stems from studies made among munition workers during World War I, has been responsible for probably the most unprofitable debate in the safety field. What is worse, it has been used to the detriment of genuine preventive measures, often as an excuse for inactivity. One of the more detailed studies, that of Arbous and Kerrich comments that this concentration on personal attributes has resulted in "...an attempt to shift the blame from the environment to the individual, calling people and not workplaces, accident prone."[41]

These aspects need to be put in their proper perspective. It is obvious that all people do not have the same degree of perception, coordination and dexterity and thus even in a group of seemingly similar individuals there will be differing degrees of performance. Furthermore, one's ability to undertake a particular task is not constant and may vary in response to a host of factors including health, personal problems, and stress in its many forms, all of which may vary over time.

Much misunderstanding has been caused by the widely differing concepts that many have concerning accident proneness, a term that has many

different interpretations. Even in cases where a person may be obviously guilty of some inattention or disregard of rules, one needs to look further. There may have been some external factors influencing events such as pressure to complete a task, tiredness brought on by long working hours, or family problems.

There is ample evidence that even where there is an equal possibility of success or failure in a given event, both success and failure are not equally distributed among all participants. If one million licensed drivers have twenty-five thousand accidents in a year, it is highly likely that, of those having accidents, some will have more than one accident. If we apply a commonly used statistician's tool—the Poisson distribution—to the 1,000,000 drivers, we could conclude that 975,310 drivers will have no accidents, 24,383 will have one accident, 305 will have two accidents, three may have three accidents. In like fashion we could consider a sample of 1,000 small employers engaged in the same trade, each employing a similar sized workforce having, between them, a total of 1,000 accidents in a given period. Then, using the same formulae, 368 could be expected to be accident-free, with a similar number having one accident, while 184 would have 2 accidents, 61 with three accidents, 15 with four accidents, three with five accidents and possibly one with six accidents. Those proponents who would support the accident proneness theory would cite in support of their assertion that those with the higher number of accidents are accident prone. However, in the original studies of munition workers, it was the fact that some workers had more than the numbers predicted on the pure chance theory as applied above. That led to the development of the accident proneness theory though this term was not coined until some years later by other researchers. This and other factors no doubt led to McKenna[50] preferring to use the term "differential accident involvement."

Another major work, in addition to the very comprehensive paper of Arbous and Kerrich, undertaken in recent years is by Shaw and Sechel. In their concluding chapter they begin rather realistically:

> "It would be very gratifying to be able to end this section of the book by giving clear-cut answers to the two basic questions: "Is accident proneness a myth or a reality? and 'If it is a reality, how much does it matter in the accident situation as a whole?'"[51]

They conclude that their findings do not support extreme thinking in either direction and emphasize the multi-causal nature of accidents. Accepting that accident proneness is not a myth, they conclude:

> "...research on accident proneness has done rather more than uncover many of the reasons why individual people have accidents. It has shown

that one of the potent reasons why accidents happen at all, is that they are encouraged rather than prevented by the prevalent attitude of the community to the whole accident problem... For research has clearly demonstrated that neither the accident researchers, nor the car designers, nor the highway engineers, nor the driving instructors, nor the licensing officials, nor the law-enforcement officers, can prevent many of the accidents which occur unless they get the cooperation of the public as a whole. It is the attitude of the public, and particularly the 'driving' public, which is going to dictate the pace of progress in accident prevention."[32]

What appears to be overlooked by those who promote the proneness theory is that, even accepting that there will be some who are more likely to be injured than others, their failure to determine to what practical use that knowledge can be put. Can those individuals be identified and restricted to activities where their unfortunate characteristics will no longer be a risk and if so, upon whom will such decisions fall? What would appear to be a more sensible and practical approach would be to ensure that accident-provocative situations are kept to a minimum. Finally perhaps the most disastrous effect of the whole debate is the tendency to blame the victim.

Publicity, Programs and Propaganda

It is probably no exaggeration to state that a tremendous waste of resources and effort has been incurred in a wide variety of safety campaigns. Some of the explanations lie in the public perception that there can be quick-fix solutions. The many in-depth studies that have been undertaken of comprehensive and expensive programs have presented most discouraging results. Haight comments:

"In general the influence of the public, whether directly or through political institutions, has been pernicious to traffic safety. It comes and goes, filling in the troughs between peaks of more exciting events; it seizes on issues without concern for the relevance or tractability of the problems; it proposes 'solutions' that are at best naive and at worst absurd; and it demands action even where action may be a waste of money."[33]

In an earlier report to the New Zealand Ministry of Transport Haight in commenting on publicity stated:

"Modern research workers take a dim view of programs aiming towards driver behavior modification, and of all such programs, publicity is probably the least loved... The Arthur D. Little study, after diligent reading, seems to contain exactly one sentence on the subject: 'We have also found no substantive data on the effectiveness of general safety propaganda; the limited information available suggests that it is not particularly effective.' Klein and Waller do not mention publicity... The last serious evaluation of road safety publicity was a conference held in Denver in 1963; perhaps it was this conference that finally put an end to an already moribund coun-

termeasure... The Denver conference found, in summary, no evidence of effectiveness of publicity on the behavior of drivers."[34]

A campaign which is simple, informative with a single message that is relevant to its audience and easily assimilated, can be effective, however.

The Role of Politics

Those seeking to influence a government to take a particular line of action or, on some occasions, to refrain from action, must present a well-reasoned case with adequate facts, data and argument. Extravagant claims and emotional appeals may attract publicity but not necessarily action, let alone the most appropriate measure. Regrettably, prevention and rehabilitation do not, as a rule, command much attention from the media except on the occasion of a disaster when so often public concern can be inflamed to a degree that is sometimes quite unwarranted by the facts. Closely allied with politics is enforcement which can be very volatile politically. However, most advocates of much greater self-regulation also accept that there will be cases where strong action will be necessary. But there are some warning signs for self-regulation from both Britain and Canada. Fidler, after detailing some experiences in Ontario, maintains that the internal responsibility system "...has subverted the regulatory intent of the legislation" through laxness in its enforcement. From Britain, Barrett and James detail what has occurred in Britain since the 1970's, including significant changes in the pattern and nature of industry and the declining influence of the trade unions. From these comments, it is fairly clear that for self-regulation to be effective there must not only be strong backing from the unions, but also the political will of government to have the enforcement agency act firmly and effectively.

CHAPTER 10
WHERE ACTION IS NEEDED

The Workplace, The Highway, Sport and Recreation and the Home Front

While most accidents can be largely traced to some failure in the system, be it a lack of adequate control in the workplace, the management of the home, the inability or unwillingness of the driver to control the vehicle satisfactorily or a similar failure in the sporting and recreational field, the opportunities for effective action vary enormously. Probably nowhere is the contrast greater than between the home and the workplace. Much of what is done in the home may also be done by someone in the course of their employment. There are, however, vast differences between the opportunities for a systematic approach and control in these two areas. On the highway the effective influence of the traffic enforcement agencies is extremely limited. In the sporting and recreational field there is a huge gap between the controlled activity of organized sport and individual recreational activity. Yet the greatest number of casualties come from those sports that are under a form of control, i.e. a referee. To a considerable extent this is probably due to the greater involvement of participants in such sports and the physical nature of the contest. Many sports and recreations with a considerable inherent hazard such as sky diving, hang gliding, ocean sailing, mountaineering, skiing and scuba diving, are lower in the casualty statistics because of the fewer participants and no doubt the more considered and professional approach of most, to the potential dangers.

In almost all countries a great deal of effort has gone into making both our workplaces and our highways safer, both in the regulatory and enforcement field as well as with a large measure of voluntary effort. There may be, however, a wide variety of views about the effectiveness of much that is done. When we come to consider the home and the sporting and recreational fields it is quite another matter. Here any suggestion of some form of regulatory action would be greeted with dismay and even outright opposition. In New Zealand recently, concern about the number of small children being drowned in home swimming pools gave rise to demands for all domestic pools to be fenced or otherwise secured. This led to Government legislation making fencing mandatory. Nevertheless some local authorities, with whom the enforcement of the legislation lay, failed to carry out their enforcement duties and at the same time many home owners neglected to comply with the law.

Many injuries in the home could be prevented with better design eliminating accident-provocative features and adopting ergonomic principles,

but that can have limited practical application in the millions of existing homes, especially where there are insufficient funds to effect even the simplest of repairs or alterations. Probably one of the greatest needs is to eliminate or reduce the features which can cause falls particularly where there are elderly residents. Wrightson and Pope[17] in their monograph on planning right from the design stage for a barrier free environment, also justifiably emphasize the other benefits that flow from such an approach. They point out, for example, that access primarily designed for those with limited mobility will also benefit many others as well. In other words, lack of adequate access is an accident provocative condition. Nevertheless, when considering the millions of homes, buildings and other places that it would be impractical to alter, the temptation to adopt a negative attitude must be avoided and there is much that can be done.

In New Zealand the local authorities that supply electricity issue with each billing small informative pamphlets giving useful tips on such matters as the correct wiring of an appliance plug and other such tasks that a home owner may be in a position to perform. Other agencies such as the fire service also perform useful educational work, even on such basics as the correct way to use a portable fire extinguisher. There are also many opportunities to learn basic first aid, especially cardio-pulmonary resuscitation, and emergency treatment for scalds and burns. Such information is easy to understand and retain. In New Zealand, as in Canada, first aid instruction has been linked with accident prevention.

The high level of serious injuries and the occasional fatality in some sports has given rise to a great deal of concern. In some cases the administering authority has looked at its rules and made changes to lessen the chance of serious accidental injury. This has not always been easy to achieve as many changes have been opposed because of possible negative effects on the flow of the game. Nevertheless, few would quarrel with the belief that organized sport itself, is in the best position to exercise its own control. There are, however, those sports already mentioned which are less structured and which can present a great deal of inherent risk. In most cases there exist clubs or other bodies which provide the necessary training. Any would-be aspirant should be encouraged to get adequate instruction. In most sports it is recognized that fitness, training and general competence are the keys, not only to good performance, but also to keeping injury-free.

Product Safety

Product liability suits have also had positive effects in some countries but, on occasion, there are negative outcomes as well. The value of a legal

right is dependent on the depth of the pocket of the person or organization from whom recovery is contemplated or the existence of adequate insurance coverage. The cost of the latter and, at times, its very existence, raise many problems which not only affect the employer and home owner but every citizen. A cover story in *Time*[38] details some of the negative aspects of product liability such as the considerable and escalating cost of liability insurance. There is a picture of workers dismantling playground equipment on Chicago's Northwest side so that the local authority may avoid having to pay large insurance premium. There are a number of sides to this issue but most of the suggested solutions have to do with reducing the cost of such suits in a number of ways and few look at the possibility of reducing the number of injuries. Herein lies a similarity with some of the arguments being proffered in New Zealand concerning Accident Compensation. Trial lawyers tend to argue, however, that the mere presence of tort rights for the injured is in itself a positive encouragement to greater preventive measures. Many would disagree.

Off-The-Job Safety

From the point of view of an employer, a worker absent from work because of an accident off the job is just as much a loss to the productive effort as if injured at work. Therefore, it is not surprising that many companies with a structured occupational health and safety organization have, within that organization, a segment entitled "Off the job safety". It is also highly likely that workers employed in undertakings with a sound health and safety policy and organization will be more inclined to take some of those influences away from the workplace at the end of each day. Another way in which larger workplaces can play an effective role is with the establishment of an alcohol and drug program, assisting personnel to cope with such problems. These conditions have a definite safety element apart from the important personal one.

What Can Be Done?

Much has been written on the effective implementation of occupational health and safety with a great variety of solutions being advocated. There are, however, some approaches that are gaining wide acceptance. These would include a *recognition of the importance of the management system, involvement of all the workforce, total management commitment and structured audits*. As far as the highway is concerned the problem of drugs and alcohol has received much publicity, so much so, that many consider that has been taking attention away from other problem areas. Occasional blitzes where enforcement is substantially increased in a specific area have certainly

resulted in a reduction of alcohol-related offenses during the period of the campaign. But does that prove that greater enforcement and more severe penalties may provide an answer? On the other hand, there remains a considerable problem with many disqualified drivers ignoring any ban placed on them by the courts. Another problem that needs to be considered is that of unsatisfactory road conditions that can cause accidents.

CHAPTER 11
CONCLUSIONS

It is clear that there are many roads to travel and success in some areas may be more easily achieved than in others. Without doubt the greatest opportunity for success lies in the workplace, for here we have systems of management and control, but these elements have yet to be more fully utilized. However, everyone in a workplace, from the most senior executive down, also has a home, almost all drive a motor vehicle and many engage in some form of sporting or recreational activity. There is every reason to exploit this aspect more fully.

Outside of the workplace it would seem that what needs to be avoided most are poorly structured and frequently expensive propaganda campaigns, often mounted in response to what may or may not be justifiable public concern or political considerations. It is in this whole area, with its varied assortment of activities, where the greatest challenge lies and where there is the most need for innovative strategies. What can be accomplished by better design and attention to ergonomic principles has yet to be recognized let alone implemented. Such action could benefit all aspects of human activity.

At the heart of the problem there is the common factor of people: Their needs, concerns, interests, attitudes and potential for involvement. Thus everywhere there is a great deal to be gained from much closer cooperation between voluntary bodies and enforcement agencies. No single organization should claim any exclusive right and all should participate to the utmost of their ability and capacity.

Editors Note (and opinion): A very timely example of this last point is the National Rifle Associations insistence on manufacturing the *right* of U.S. citizens to "bear arms." It would be much more sensible and sensitive if the NRA would put aside its outdated attitudes and cooperate with those organizations interested in appropriate gun control.

ENDNOTES

Chapter One
Introduction

1. Franklin, M.A. (1975) "Personal Injury Accidents in New Zealand and the United States: Some Striking Similarities," *Stanford Law J.*. 27, 653-672.

Chapter Two
Prevention, Rehabilitation and Compensation: The Vital Trio

2. Ison, T.C. *The Forensic Lottery*, London: Staples Press, (1967).
3. *Compensation for Personal Injury in New Zealand: Report of the Royal Commission* (1967) Wellington: Govt. Printer, 49.
4. Ibid. 52.
5. *Personal Injury: Prevention and Recovery, Report No. 4*, (1988) Law Commission, Wellington: Govt. Printer, xi.
6. Ibid.
7. Chelius, J.R. (1986) The Status and Direction of Workers' Compensation, *Current Issues in Workers' Compensation*, Kalamazoo: Upjohn Institute, 7.

Chapter Three
Cost Factors—The Influences for Change: Is It Cost vs. Humanity?

8. Parsons, K.R. *Violence on the Road*, Wellington: Department of Justice, (1978).

Chapter Four
Health Effects of the Environment

9. Hunter, D. *The Diseases of Occupations*, London: Hodder & Stoughton, (1978) 37.
10. Weiler, P. (1980) *Reshaping Compensation for Ontario*, A Report Submitted to the Minister of Labour, (1980) 137.
11. *Making Prevention Pay: Final Report of the Interagency Task Force on Workplace Safety and Health*, Rosslyn, Va. (1978) VI-17.
12. Barth, P.S. & Hunt. H.A. *Workers' Compensation and Work-related Illness and Disease*, Cambridge Mass. MIT Press, (1982) 17.
13. Ibid. 17.
14. Roblee, R. The Dark Side of Workers' Compensation: Burdens and Benefits in Occupational Disease Coverage, *Industrial Relations Law J.* (1978) 2, 596-631, 623.
15. Barth & Hunt. Op. cit. 48.
16. *Workplace Pollution: Working Paper 53*, Law Reform Commission of Canada, 78.

Chapter Five
Error-Provocative Situations: The Effect of Change

17. Johnson, W.G. *MORT Safety Assurance Systems*, New York: Dekker, (1980) 53.
18. Toffler, A. *Future Shock*, London: Pan Books, (1972).
19. Ibid. 41.
20. Kletz, T.A. Human Failing, *Hazard Prevention*, (1985) 21, 5, 11.
21. *Report of the Royal Commission to Enquire into the DC 10 Crash on Mt Erebus, Antartica*, (1981) Wellington: Govt. Printer, 159.

Chapter Six
Measuring Performance: How Successful Have We Been?

22. Ellis, L. A Review of Research Efforts to Promote Ocupational Safety, *J. of Safety Research*, (1975) 7, 180-9, 187.
23. *Success and Failure in Accident Prevention*, (1975) London: HMSO 3.

Chapter Seven
The Place of Regulation

24. *Safety and Health at Work: Report of the Committee Cmnd. 5034*, London: HMSO, 151.
25. Calabresi, G. & Bobbitt, P. *Tragic Choices*, (1977) New York: Harper & Rowe, 7.
26. Wigglesworth, E.C. *How Effective is Safety Legislation? The Harold Thomas Oration*, (1986) International Conference, Adelaide, Mimeo, 3.1.2.
27. Arbous, A.B. & Kerrich, J.E. Accident Statistics and the Concept of Accident Proneness, Pt. 1, *Biometrics*, (1951) 7, 341-390, 343.
28. Morgan, P. The Costs and Benefits of the Power Presses Regulations 1965, *British J. of Industrial Relations*, (1986) 21, 181-196.
29. Wigglesworth, E.C. Legislation and Injury Control, *Medicine, Science and the Law*, (1978), 18, 191-9, 194.
30. Wigglesworth, The Harold Thomas Oration, Op. cit. 7.
31. Chelius, J. An empirical analysis of Safety Regulations, *Supplemental Studies for the National Commission of State Workmen's Compensation Laws, III*, Washington DC: USGPO, (1973) 64.
32. Ison, T.G. Re the Uses and Limitations of Sanctions in Industrial Health and Safety, *Workers' Compensation Reporter*, (1975) 2, 203-216, 204.
33. Safety and Health at Work, Op. cit. 82.
34. Glasbeek, H.J. & Rowland, S. Are Killing and Injuring at Work Crimes? *Osgoode Hall Law J.* 17, (1978) 506-594.
35. *People* v. *O'Neil*, No. 83C-11091 (Cook County Cir. Ct. June 15 1985).
36. Workplace Pollution, Op. cit. 75.

Chapter Eight
Alternatives and Supplements to Regulation

37. *J. of Law and Economics*, (1968) 11, 161-174.
38. Compensation for Personal Injury in New Zealand, Op. cit. 51.

Chapter Nine
Road Blocks to Effective Preventive Measures

39. *The State of the Art of Traffic Safety*, Arthur D. Little Inc. New York: Praeger, (1970) 31.
40. Ibid. 31.
41. Haddon, W., Suchman, E. & Klein, D. *Accident Research: Methods and Approaches*, Praeger. New York: 31.
42. Ibid. 5.
43. Ibid. 4.
44. Ibid. 5.
45. Haight, F.A. Road Safety: A Perspective and a New Strategy, *J. of Safety Research*, (1985) 16, 91-8, 92.
46. The State of the Art of Traffic Safety, Op. cit. 4.

47. Ibid. 4.
48. Langley, J. & McLoughlin, E. *A Review of Research on Unintentional Injury: Special Report Series No. 10*, Dunedin: Medical Research Council of New Zealand (1987).
49. Arbous & Kerrich, op. cit. 363.
50. McKenna McKenna, F.P. Accident Proneness: A Conceptual Analysis, *Accident Analysis and Prevention*, (1983) 15, 65-71.
51. Shaw, L. & Sichel, S. *Accident Proneness* Pergamon Oxford, (1971).
52. Ibid. 421.
53. Haight, op.cit. 95.
54. Haight, F.A. *Factors Affecting Road Safety in New Zealand, with Special reference to the Programs of the Ministry of Transport* mimeo, (1972) 70.
55. Fidler, R. The Occupational Health and Safety Act and the Internal Responsibility System, *Osgoode Hall Law J.* (1987) 24, 315-352, 315.
56. Barrett, B. & James, P. Safe Systems: Past, Present—Future? *Industrial Law J.* (1988) 17, 26-40.

Chapter Ten
Where Action is Needed

57. Wrightson, B. & Pope, C. *From Barrier Free to Safe Environment: The New Zealand Experience, Monograph #46*, World Rehabilitation Fund, New York: 1989.
58. *Time*, (1986) 127, 12, 20-28.

INTERNATIONAL EXCHANGE OF EXPERTS AND INFORMATION IN REHABILITATION

The following monographs are available from WRF and can be ordered by writing to IEEIR, World Rehabilitation Fund, 400 East 34th Street, New York, NY 10016.

#14 Childhood Disability in the Family.
Elizabeth Zucman (1980), 80 pp.

#15 A National Transport System for Severely Disabled Persons—A Swedish Model
Birger Roos, (1982), 18 pp.

#18 International Approaches to Issues in Pulmonary Disease.
Irving Kass, Ed. (1982), 40 pp.

#21 Rehabilitation in Australia and New Zealand: U.S. Observations
Diane Woods, Ed. (1983), 189 pp.

#23 Methods of Improving Verbal and Psychological Development in Children with Cerebral Palsy in the Soviet Union.
Robert Silverman, Tr. (1983), 96 pp.

#24 Language Rehabilitation after Stroke: A Linguistic Model.
Gunther Peuser (1984), 67 pp.

#25 Societal Provision for the Long-Term Needs of the Mentally and Physically Disabled in Britain and in Sweden Relative to Decision-Making in Newborn Intensive Care Units.
Rev. Ernie W.D. Young, PhD (1985), 86 pp.

#26 Community-Based Rehabilitation Services—Experience of Bacolod, Philippines and the Asia/Pacific Region.
Antonio Periquet, M.D., (1984), 63 pp.

#27 Independent Living and Disability Policy in the Netherlands: Three Models of Residential Care and Independent Living.
Gerben DeJong, PhD (1984), 94 pp.

#28 The Future of Work for People with Disabilities: A View from Great Britain.
Paul Cornes (1984), 80 pp.

#30 Employer Initiatives in the Employment or Re-Employment of People with Disabilities: Views from Abroad.
Diane Woods and Sheila Akabas, Eds. (1985), 128 pp.

#31 The More We Do Together: Adapting the Environment for Children with Disabilities.
The Nordic Committee on Disability. (1985), 85 pp.

#32 Life Transitions of Learning Disabled Adults: Perspectives from Several Countries.
Kate Garnett and Paul Gerber, Eds. (1985), 64 pp.

#33 Bridges from School to Working Life: The View from Australia.
Trevor Parmenter (1986), 76 pp.

#34 Independent Living and Attendant Care in Sweden: A Consumer Perspective.
Adolph Ratzka (1986), 80 pp.

#35 Evaluation and Information in the Field of Technical Aids for Disabled Persons: A European Perspective.
A. Pedotti and R. Andrich, Eds. (1986), 59 pp.

#36 An International Perspective on Community Services and Rehabilitation for Persons with Chronic Mental Illness
Mary A. Jansen, Ed. (1987), 78 pp.

#37 Interactive Robotic Aids—One Option for Independent Living: An International Perspective
Richard Foulds, Ed. (1986), 64 pp.

#38 Educating the Pre-School Child with Cerebral Palsy at Home: Suggested Techniques from Russia.
Robert Silverman, Tr. (1987), (unpublished: WRF with UCPNYC), 120 pp.

#39 Family Supports for Families with a Disabled Member
Dorothy Lipsky, Ed. (1987), 79 pp.

#WRF/HRC The Changing Nature of Work, Society and Disability: The Impact on Rehabilitation Policy.
Diane Woods, David Vandergoot, Eds. (1987), 64 pp.

#40 New Developments in Worker Rehabilitation: the WorkCare Model in Australia.
Andrew G. Remenyi, Hal Swerissen, Shane A. Thomas, Eds. (1987), 102 pp.

#41 Social Security Disability Programs: An International Perspective.
Barbara Duncan, Diane Woods, Eds. (co-published by WRF with Rehabilitation International), 160 pp.

#42 Volunteer Rehabilitation Technology.
Jim Tobias, Diane Woods, Eds. (1988), 89 pp.

#43 Disability in New Zealand: A Study of Rehabilitation and Disability Organizations.
L.R. Newsome (1988)

#44 From Barrier Free to Safe Environments: The New Zealand Experience.
William Wrightson (in press)

#45 Aphasia Rehabilitation in the Asia-Pacific Region.
(in press).

#46 Prevention: The First Step in Rehabilitation.
Ian Campbell

#47 Developing Strategies for Communications about Disability: Experiences in the U.S., Hong Kong, India and Pakistan.
Barbara Kolucki. (in press)

All monographs are $3.00, except for #15 which is $1.50, and #31 and #41 which are $5.00 each. (Double the amount for overseas air.) Tel. 212-679-2934.

Other titles being developed: *Rehabilitation and Special Education in China, Rehabilitation and Special Education in Korea,* and *Rehabilitation and Special Education in Samoa and the Pacific, and Community Rehabilitation Services for Persons with Brain Damage in Israel.*

WORLD REHABILITATION FUND, INC.
400 East 34th Street
New York, NY 10016

Howard A. Rusk, Jr.
President

James F. Garrett, Ph.D.,
Executive Vice President
and Principal Investigator

INTERNATIONAL EXCHANGE OF EXPERTS AND INFORMATION IN REHABILITATION

Diane E. Woods
Project Director

James H. Cunha
Project Assistant

Frances Riccobono
Project Disseminator